



ART. VII. *BELINURUS CARTERI*, A NEW XIPHOSURAN FROM
THE UPPER DEVONIAN OF PENNSYLVANIA

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Xiphosurans were probably fairly abundant in the Upper Devonian seas of the Penn-York embayment. Although the geological and geographical ranges of the known records are widespread, fossil remains of Xiphosurans are rather rare. Casts or tracks have been reported from near the following localities in Pennsylvania: LeBoeuf, Lanesboro, Ridgeway, Warren, Uniontown, Corry, and Lewis Run, and in New York from Olean and Wellsville. Any new record of the occurrence of Xiphosurans is therefore of interest. Probably many more specimens would be found if a specific search was made.

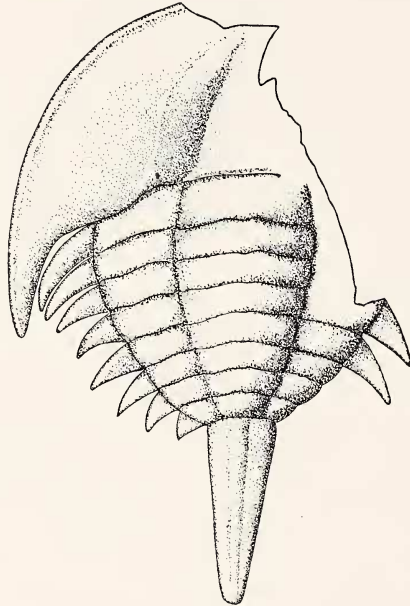
Through the kindness of Dr. I. G. Reimann of the Buffalo Society of Natural Sciences, Buffalo, New York, a Xiphosuran belonging to the genus *Belinurus* was intrusted to me for study. The specimen was collected from the lower Cattaraugus beds at the Hanley Quarry, Lewis Run, Pennsylvania, six miles south of Bradford, Pennsylvania, by Mrs. A. L. Carter of Kenmore, New York, for whom the species is named. Although it is a rather poorly preserved specimen, almost all of the cephalothorax and abdomen are present and the telson is complete.

Belinurus carteri sp. nov.

The general shape of the specimen is similar to the modern king crab or horseshoe crab, *Limulus*. It has been flattened in preservation but there is no evident distortion which might change its proportions. Dimensions of the form are as follows: length 27.3 mm.; width 29.6 mm.; the telson is 10.9 mm. long and at the anterior end, 3.1 mm. wide.

The cephalothorax is semi-elliptical with the anterior margin probably well rounded. The posterior margin curves from the genal spines over the first abdominal segment, then forward to the rachial furrow. The genal spines are thick, of medium size in length, and extend backward to a point opposite the third pleural segment of the abdomen. The cardiac lobe is highly convex and irregularly triangular in outline. The lobe is partly missing and that which is present is so poorly preserved that very little

description of it is possible. The ophthalmic ridge is not very well preserved and is only faintly expressed on the form. It slopes gradually to the posterior of the cephalothorax at which point it blends into the curve of the margin where it overlaps the first segment of the abdomen. A slight widening of the ridge at about the midpoint may constitute the position of the compound eye.



TEXT FIGURE. Type of *Belinurus carteri* Eller, $\times 2$.

This specimen is in the Museum of the Buffalo Society of Natural Sciences, no. E9644.

The flattened abdomen is sub-triangular in shape. It consists of eight segments separated from each other by well defined grooves. The first segment is the widest and the remaining by seven are fairly uniform in width. It is not possible to determine from the specimen which segments are movable and which are anchylosed. The rachis is wide but narrows rapidly to the posterior. The pleural region is narrow. Each pleura bears a spine. The spines are long at the anterior segments but decrease in size posteriorly.

A short but wide and thick telson is present. At the anterior end it extends across the full width of both the rachis and pleura. In most

forms the telson is usually only as wide as the rachis. A ridge less than one third the width of the telson extends along its full length.

REMARKS

This form fits rather well within the characteristics of the Xiphosuran genus *Belinurus*. It has, however, two minor characters quite different, as far as the writer knows, from other species of *Belinurus*. The wider telson is especially a distinct character while the width of the rachis, as compared to the pleura, is exceptional. In other respects the form has individual characters similar to other species of the genus. The cephalothorax is similar to *Belinurus alleganyensis* Eller (1938) except that the posterior margin of *Belinurus carteri* m. is not as straight. The abdomen, except for the width and character of the rachis, is similar to *Belinurus koenigianus* Woodward (1866-1878), *Belinurus trechmanni* Woodward (1918), *Belinurus grandoeous* J. and W. (1899), and *Belinurus baldwini* Woodward (1908).

Caster (1930) figures a fragment of *Protolimulus eriensis* Williams from the same locality as the presently described form (Hanley Quarry, Lewis Run, Pennsylvania) and a *Protolimulus*, Caster (1930), from near Warren, Pennsylvania. The specimens figured by Williams (1885) and by Caster are shown in ventral views so they cannot be compared readily with *Belinurus carteri* m. The telsons of *Protolimulus eriensis* Williams and *Belinurus carteri* m. are very much alike. The long genal spines and the position, number, and character of the pleural spines differ greatly in both species. From the figures of *Protolimulus eriensis* Williams it would appear that the abdomen is short and the pleural segments must curve backwards since the pleural spines seem to originate along the posterior margin and point in a more or less perpendicular manner to the margin. There is evidence of only five (?) segments on *Protolimulus eriensis* Williams but the genal spines may hide additional ones from view. In examining a cast of Williams' specimen in a former study (Eller 1938), the writer was interested in its inorganic appearance. It resembled very much some of the mud-slipping structures so common in the Upper Devonian of that area. Perhaps the ventral side of the various specimens of *Protolimulus eriensis* Williams is somewhat distorted or was partially destroyed during burial and the result is its present appearance. If this is true, then there is a possibility that *Protolimulus eriensis* Williams is in reality a *Belinurus* and *Belinurus carteri* m. might be referred to that species after further study of better specimens.

BIBLIOGRAPHY

CASTER, K. E.

1930. Bull. Am. Paleontology, vol. 15 (no. 58), pp. 145-316.

1938. Jour. of Paleontology, vol. 12, no. 1, pp. 3-60.

ELLER, E. R.

1938. Annals Carnegie Mus., vol. XXVII, art. VIII, pp. 129-150.

1938. Annals Carnegie Mus., vol. XXVII, art. X, pp. 155-159.

JONES, T. R. AND WOODWARD, H.

1899. Geol. Mag., vol. 6, no. 423, p. 388.

WILLIAMS, H. S.

1885. Amer. Journ. Sci., vol. 30, ser. 3., pp. 45-49.

1885. Geol. Mag., dec. 3, vol. 11, pp. 427-429.

WOODWARD, H.

1866-1878. British Fossil Crustacea. Paleontographical Soc. of London.

1909. Geol. Mag., dec. 5, vol. 8, pp. 540-541.

1918. Geol. Mag., ser. 6, vol. 5, pp. 462-471.